

SECTION 02551 - DUAL CONTAINMENT PIPING

City of San Diego, CWP Guidelines

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. The CONTRACTOR shall furnish and install dual containment piping, fittings, leak detection and all appurtenant work, complete and in place, all in accordance with the requirements of the Contract Documents.

1.2 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Section 02600 - Pipe Construction
 - 2. Section 15000 - Piping, General
 - 3. Section 15010 - Mill Piping—Exposed and Buried
 - 4. Section 15030 - Pipe Identification Systems

1.3 SHOP DRAWINGS AND SAMPLES

- A. **Shop Drawings:** The CONTRACTOR shall submit shop drawings of the containment piping system in accordance with the requirements of Section 01300 - Contractor Submittals.
- B. **Certifications:** The CONTRACTOR shall furnish a certified affidavit of compliance for the containment systems and other products furnished under this section of the specifications.
- C. All expenses incurred in attaining certification of the containment piping system shall be borne by the CONTRACTOR.

PART 2 - PRODUCTS

2.1 BLACK IRON, PVC, AND CPVC PIPE

- A. Black iron, PVC, and CPVC pipe used as secondary containment piping shall be as described in Section 15010 - Mill Piping—Exposed and Buried.

2.2 FIBERGLASS REINFORCED PIPE

- A. Fiberglass reinforced pipe shall be machine-made reinforced thermosetting resin pressure pipe, manufactured by the filament winding process to ASTM D 2996, suitable for exposed or buried conditions depending on the service required. Unless otherwise shown, it shall be made of epoxy resins and continuous glass filaments, wound together over a resin-rich reinforced liner.
- B. Wall thickness of the fiberglass containment conduit shall be 150 mils.

2.3 CONTAINMENT PIPE

- A. The secondary containment pipe shall contain all hazardous material discharged from a service pipe for a period of time equal to or longer than the maximum anticipated time sufficient to allow recovery of the discharged material. All secondary containment piping shall be such that it will contain 100% of the volume of the service pipe. Containment shall be drainable and air testable. At all low points and at the end of chemical pipe runs of containment pipe, a tee with threaded plug, installed branch up, shall be installed in the containment pipe as inspection point or port. Under no circumstances shall distance between inspection ports exceed 200 feet.

2.4 SUBASSEMBLIES

- A. Gland seals and anchors shall be designed and factory-prefabricated to prevent the ingress of moisture into the system. All subassemblies shall be designed to allow for complete draining and drying of the double-pipe.

2.5 FITTINGS

- A. All fittings shall be factory manufactured. Unless otherwise indicated, fittings for the dual containment pipe shall be constructed using injection molded fittings and shall have the same pressure rating as the corresponding service pipe. When the carrier and containment pipe are the same material, all containment fittings shall be unitized construction with the carrier and containment integrally anchored together to prevent movement of the carrier relative to the containment within the fitting. Anchors shall be of sufficient thickness to withstand the maximum possible end loads that can be generated by the carrier pipe during the life of the system. Bends must be anchored on both ends. Tees and laterals must be anchored on both the run and the branch connections.

2.6 PIPE SUPPORTS

- A. Supports shall be designed and installed by the manufacturer. The manufacturer shall design and fabricate the system so that the pipe is continuously double supported. All pipe supports shall be circular and solvent welded to the carrier pipe. The supports at both ends of every straight section shall be welded to both the carrier and containment pipes in order to facilitate the simultaneous welding of all secondary contained pipe and fittings. Support clips shall not be allowed.

2.7 JOINTS

- A. Unless otherwise shown, black iron joints shall be threaded connections, and PVC, CPVC, fiberglass joints shall be solvent welded.

2.8 PIPING SHIELDS

- A. All single-walled chemical pipe joints, and joints at valves, pumps, and other miscellaneous chemical system equipment shall be provided with plastic cloth shields. Shields shall also be provided on all chemical valve stems. The cloth shields shall be clear in interior applications and UV stabilized in outdoor applications. Shields shall be provided with pH leak indicating patches and constructed from materials that are resistant to the chemical fluid in the pipe being wrapped. Shields shall be manufactured by **Advance Products and Systems, Inc., or equal**.

2.9 DIESEL FUEL LEAK DETECTION SYSTEM

- A. The double containment diesel fuel system shall be equipped with a leak detection system for determining the presence of diesel fuel in the containment pipe. The leak detection and location system shall operate on the principle of pulse energy reflection. The system shall be capable of detecting diesel fuel, shorts in the cable, and breaks in the monitoring circuitry. The presence of water in the containment pipe shall not cause the system to register a false alarm.
- B. **Leak Detection Cable:** The leak detection cable shall be continuously placed in the bottom of the secondary containment pipe. The cable shall be suitable for continuous exposure through 220 degrees F.
- C. The leak detection system control panel shall be located as shown on the drawings. The panel shall be NEMA 4X and provide a visual and audio alarm in case a leak is detected, alarm test and acknowledge, and reset buttons.
- D. The leak detection system shall be installed for all runs of the diesel fuel piping system except the indoor run of the fuel containment pipe from the day tank to the generator.

2.10 SCHEDULES

- A. The piping materials for the carrier and containment pipes are shown in the following schedule:

Piping Material Schedule

<u>Service</u>	<u>Carrier</u>	<u>Containment</u>
Sodium Hydroxide	PVC	PVC
Sulfuric Acid	CPVC	CPVC
Scale Inhibitor	PVC	PVC
Cleaning System	PVC	PVC
Diesel Fuel	Black Iron	Fiberglass
Containment Drains	PVC	PVC

2.11 MANUFACTURERS

- A. Products shall be of the following manufacturers or equal.
 - 1. **PermAlert Environmental Specialty Products, Inc., or equal**
 - 2. **PermAlert Environmental Specialty Products, Inc., or equal**

PART 3 - EXECUTION

3.1 GENERAL

- A. The dual containment piping system shall be installed according to the manufacturer's printed instructions and recommendations.

- B. Trained field representatives of the containment system supplier shall provide technical field support during critical periods of installation and approve final installation.
- C. The containment piping shall be fabricated by a manufacturer that has successfully manufactured and installed at least one pipe containment system of comparable size and complexity in the recent past.
- D. The dual containment systems shall be manufactured by **PermAlert Environmental Specialty Products, Inc., or equal.**

3.2 TESTING

- A. The testing schedule shall be submitted to the CONSTRUCTION MANAGER in writing for approval a minimum of 48 hours before testing is to start.
- B. All test equipment, temporary valves, bulkheads, or other air control equipment and materials shall be determined and furnished by the CONTRACTOR for review and approval by the CONSTRUCTION MANAGER. No materials shall be used which would be injurious to the construction or its future function.
- C. Unless otherwise provided herein, air for testing shall be furnished by the CONTRACTOR.
- D. All testing operations shall be performed in the presence of the CONSTRUCTION MANAGER.
- E. Prior to pressure testing, the containment system shall be flushed or blown out as appropriate. The CONTRACTOR shall test the containment system either in sections or as a unit. No section of the fuel system piping shall be tested until all field-placed concrete or mortar have attained an age of 14 days. The test shall be made by closing valves when available, or by placing temporary bulkheads in the pipe and filling the line with air. The CONTRACTOR shall be responsible for ascertaining that all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to, or movement of, the adjacent pipe.
- F. The containment system shall be filled at a rate which will not cause any damage to the line or adjacent structures.
- G. The secondary containment piping shall be air tested at 150 psi, and the service piping shall be hydrostatically tested to 150 psi, measured at the lowest point of the containment system section being tested. The test pressure shall be held for not less than 4 hours.
- H. The containment system shall not show a loss of pressure of more than 5 percent. In case the containment system fails to pass the prescribed leakage test, the CONTRACTOR shall determine the cause of the leakage, shall take corrective measures necessary to repair the leaks, and shall again test the containment system.
- I. Secondary containment pipe joints completed at the factory shall be air tested and shall have no leakage.

** END OF SECTION **